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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,758	07/08/2003	Christopher W. Gabrys	IG2257US	9896
27410	7590	06/15/2005	EXAMINER	
J. MICHAEL NEARY 542 SW 298TH STREET FEDERAL WAY, WA 98023			ELKASSABGI, HEBA	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/615,758

Applicant(s)

GABRYS, CHRISTOPHER W.

Examiner

Heba Elkassabgi

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(Pm)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-10, 14-17 and 19 is/are rejected.
- 7) ☒ Claim(s) 5-7, 11-13, 18, and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 01/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

No foreign or domestic priority has been claimed.

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 01/29/04, has been considered by the Examiner. The submission is in compliance with the provisions of 37 CFR 1.97.

### ***Specification***

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al. (US Patent 6373162) and further in view of Kawai et al. (US Patent 5436518).

Liang et al. discloses in figures 1 an electrical machine having a rotor (18) supported for rotation about an axis of rotation relative to a juxtaposed stator (16) that is stationary and magnetically interacts with rotor (18). A rotor (18) having a ferromagnetic rotor structure with poles around a circumference. The poles arranged in a circumferentially alternating array of ferromagnetic and permanent magnet (Liang et al. discloses that the magnets can be of any soft magnetic material) poles (see column 4, lines 63-67). Ferromagnetic and permanent magnet poles face a magnetic air gap (see attached figure #1, AG) created in the ferromagnetic structure. A stator (16) having a stationary air core (36) armature located in the magnetic air gap (AG) and the air core armature (36) having windings (38). A stator (16) with a field coil (38) that generates field coil flux that flows in a flux path through the ferromagnetic poles, the magnetic air gap and the ferromagnetic rotor structure. The permanent magnet poles generate permanent magnet flux. The field coil flux and the permanent magnet flux induce an AC voltage in the windings of the air core armature as the rotor rotates (see columns 5 (line 55-67), 6 (entire column), and 7 (lines 1-5)) (claim 1). In regards to claim 2, the permanent magnet flux flows mostly axially and radially through the ferromagnetic rotor structure when the field current to the field coil is off and when the field current has a polarity such that the field current bucks the induced AC voltage in the multiple phase windings of the air core armature (see column 5 (line 55-67), column 6 (entire column),

and column 7 (lines 1-5)). Liang et al. does not disclose the machine to be free of laminations.

Kawai et al discloses an electric machine that is free of laminations in which the chosen structure in order to provide sufficient use of the electrical machine (claim 3).

Liang et al. and Kawai et al. disclose the claimed invention except for the magnets being ferromagnetic and permanent magnets. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a desired and suitable material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to choose the desired structure of the electrical machine being free of lamination as taught by Kawai et al. and to choose the desired material of choice as taught by In re Leshin.

Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al. (US Patent 6373162).

Liang et al. discloses in figure 1, a rotor (18) supported for rotation about an axis of rotation relative to a juxtaposed stator (16) that is stationary and magnetically interacts with the rotor (18). A rotor (18) having a ferromagnetic rotor structure with poles around a circumference and the poles arranged in a circumferential array of ferromagnetic and permanent magnet poles (Liang et al. discloses that the magnets can

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be of any soft magnetic material, see column 4, lines 63-67). The ferromagnetic and permanent magnet poles face a magnetic air gap (see attached figure #1, AG) created in the ferromagnetic structure. A stator (16) has a stationary air core armature (36) located in the magnetic air gap (AG) and the air core armature (36) has windings (38). The stator (16) has a field coil that generates field coil flux that flows in a flux path through the ferromagnetic poles, the magnetic air gap, and through a ferromagnetic rotor structure. The permanent magnet poles generate permanent magnet flux, and a field coil flux and the permanent magnet flux induces an AC voltage in the windings of the air core armature as the rotor rotates (see column 5 (line 55-67), column 6 (see entire column), and column 7 (lines 1-5)) (claim 4). In regards to claim 8, a rotor (18) having a magnetic insulating structure (80,82) that separates two portions of the ferromagnetic Liang et al. discloses that the magnets can be of any soft magnetic material, see column 4, lines 63-67) rotor structure (18) such that each portion bounds opposite sides of the magnetic air gap.

Liang et al. discloses the claimed invention except for the magnets being ferromagnetic and permanent magnets. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a desired and suitable material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to choose the desired material of choice as taught by In re Leshin.

Claims 9-10, 14-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al. (US Patent 6373162).

Liang et al. discloses in figure 1 a rotor (18) supported for rotation about an axis of rotation relative to a juxtaposed stator (16) that is stationary and magnetically interacts with the rotor (18). The rotor (18) includes a ferromagnetic rotor structure having poles around a circumference, and arranged in a circumferential array of ferromagnetic and permanent magnet poles (Liang et al. discloses that the magnets can be of any soft magnetic material, see column 4, lines 63-67). The ferromagnetic and permanent magnet poles face a magnetic air gap (see attached figure #1, AG). The stator (16) has a stationary air core armature (36) located in the magnetic air gap (AG) and the air core armature (36) has windings (38). The brushless hybrid electrical machine has a field coil that generates field coil flux that flows in a flux path through the ferromagnetic poles, magnetic air gap, and through the ferromagnetic rotor structure. The permanent magnet poles generate permanent magnet flux, in order for the field coil flux and the permanent magnet flux induce an AC voltage in the windings of the air core armature as the rotor rotates (see column 5 (line 55-67), column 6 (entire column), and column 7 (lines 1-5)) (claim 9). In regards to claim 10, the magnetic air gap (AG) is bounded on both sides by rotating surfaces of the rotor (18). In regards to claim 14, the

circumferential array of ferromagnetic and permanent magnet poles (Liang et al. discloses that the magnets can be of any soft magnetic material, see column 4, lines 63-67) has a circumferential alternation of permanent magnet and ferromagnetic poles. In regards to claim 15, a circumferential array of ferromagnetic and permanent magnet poles has a circumferential array of alternating polarity of permanent magnet poles (as shown in figure #1). In regards to claim 16, a permanent magnet flux flows primarily between the alternating polarity permanent magnet poles in the rotor (see column 5 (line 55-67), column 6 (entire column), and column 7 (lines 1-5)). In regards to claim 17, the ferromagnetic poles (18) are located adjacent permanent magnet poles (18) of one polarity (since Liang et al. discloses that the magnets are of soft magnetic material and ferromagnetic it would be obvious that since the magnets are placed alternatively for the poles then the magnets can be alternatively placed to one another based on the material choice). In regards to claim 19, the permanent magnet poles (18) are located on both sides of the magnetic air gap (AG).

Laing et al. discloses the claimed invention except for the magnets being ferromagnetic and permanent magnets. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a desired and suitable material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.



It would have been obvious at the time the invention was made to a person having ordinary skill in the art to choose the desired material of choice as taught by In re Leshin.

***Allowable Subject Matter***

Claims 5 –6, 11-13,18, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claim 5, the prior art does not disclose a permanent magnet flux flows in a path primarily excluding the ferromagnetic poles when the field coil is off.

Dependent claims 6-7 are allowed for being dependent upon claim 5.  
In regards to claim 11, the prior art does not disclose a brushless hybrid electrical machine has only a single magnetic air gap.

Dependent claims 12-13 are allowed for being dependent upon claim 11.

In regards to claim 18, the prior art does not disclose that the alternating polarity permanent magnet poles are arranged such that one polarity of permanent magnet pole has a shorter circumferential length than the other.


In regards to claim 20, the air core armature is wound such that the AC voltage in the windings is sinusoidal.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heba Elkassabgi whose telephone number is 571-272-2023. The examiner can normally be reached on Weekdays, 9:00 am to 7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Class 310- Electrical Generator/Motor Structure

  
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